

机械性损伤

Mechanical Injury



Definition

Injury

Force instrument

Mechanical injury



Classification

Force instrument	Manner of injury	Time
blunt	suicide	ante-mortem
sharp	homicide	perimortem
firearm	accident	postmortem
	artificial	



Mechanism

- **Instrument, Force: m 、 V 、 Δt 、 S**
- **Body: physical characteristics**

Different tissue react differently to same force



Basic Type of Injury

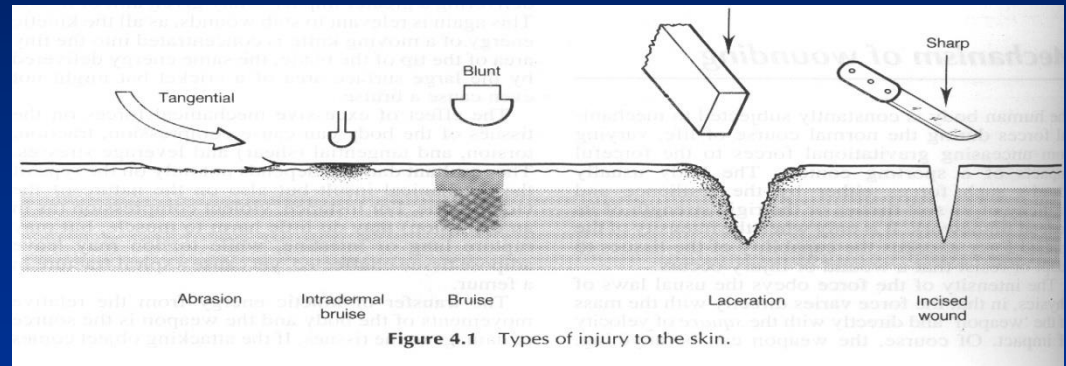
Main changes --- structure

Main changes --- function



★ Structure Changes

- **Abrasion**
- **Contusion**
- **Wound**
- **Fracture、 Dislocation**
- **Rupture of Visceral**
- **Amputation**



擦伤 Abrasion (Scratch, Graze)

Blunt instrument

Friction

Most superficial injury

No vessels damaged



Type and Characteristic

- 抓痕 *scratch or finger nail abrasion*
- 擦痕 *grazes or brush abrasion*
- 撞痕 *impact or crushing abrasion* （交通事故）
- 压擦痕 *friction or pressure abrasion* （缢吊）



To Clinical Doctors

- **Most Slight Injury**
- **Usually Ignored**



To Forensic Medical Experts

- Evidence of Force
- Direction of the Force
- Inflammation—Ante-mortem
- Color change—Time of Injury
- Distribution—Purpose of Criminal Suspects
- Pattern of Force Instrument



挫伤 *Contusion* (*Bruise*)

Blunt Instrument

Vessels Underneath Skin Layer Damaged



Characteristic

- **Bruise (intracutaneous, subcutaneous)**
- **With Abrasion**
- **Swelling**
- **Inflammation**



Question

- How to distinguish contusion and livor mortis?



颜色变化与损伤时间推断

Color Change and Time

- **Red—Immediate**
- **Blue—1-4d**
- **Green—4-7d**
- **Yellow—7-10d**
- **Normal—14-21d**



To Clinic Doctors

- **Limited Contusion—nonfatal injury**
- **Diffuse Contusion—Traumatic Shock or ARF**
- **Slight External, Heavy Internal injury**
- **Heavy Internal Injury maybe Ignored—very dangerous**



To Forensic Medical Experts

- **Evidence of Force**
- **Ante-mortem Injury**
- **Color Change—Time of Injury**
- **Distribution—Purpose of Suspects**
- **Pattern—Force Instrument**



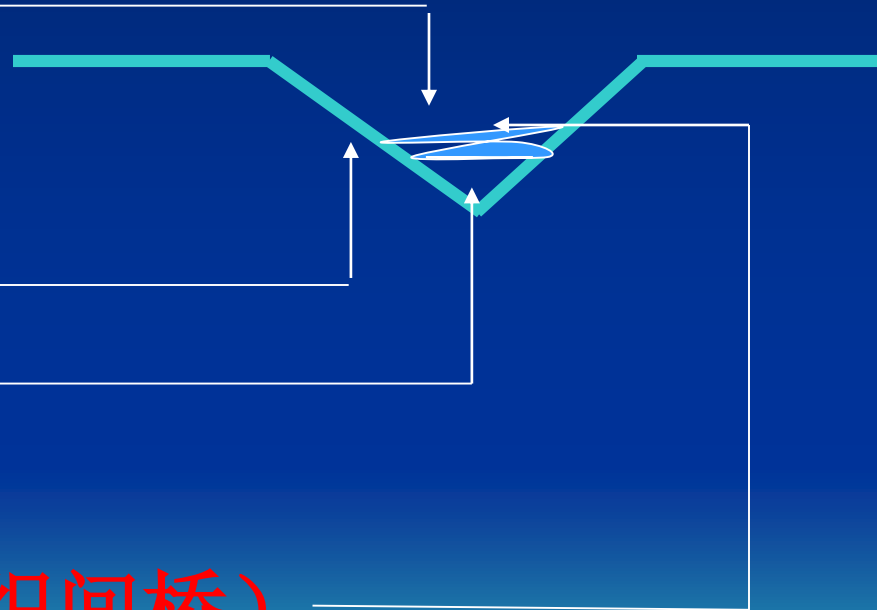
创 Wound

Full Skin Tear or Split



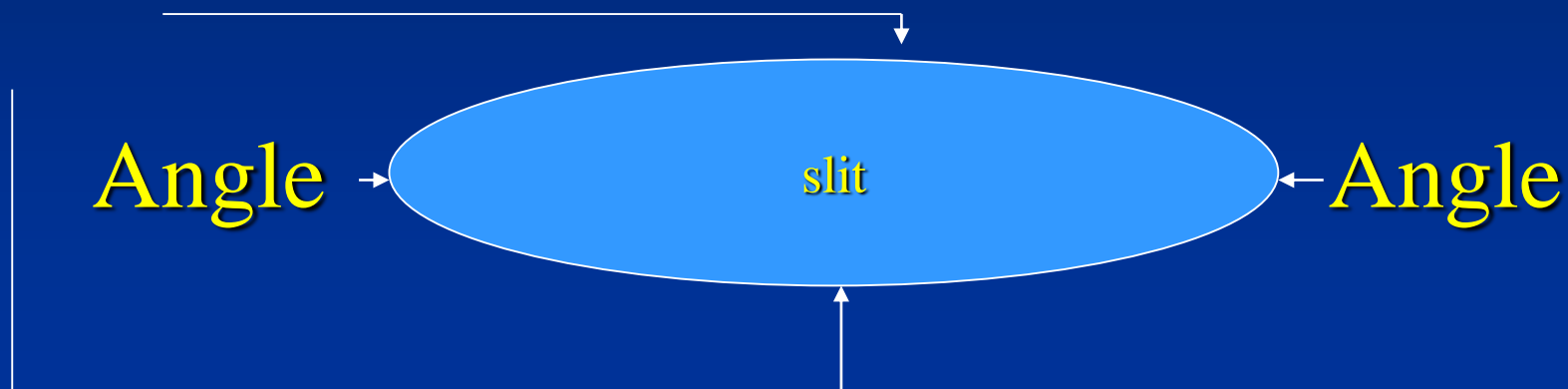
Characteristic

- Slit
- Cavity
- Edge
- Wall
- Bottom
- Angle
- Tissue bridge (组织间桥)



syw

Edge



分类Classification of Wound

Blunt—Tear, Laceration, poking

Sharp—Cut, Gash, Stab, Scissors

Firearm—GSW, Explosion



挫裂创与锐器创的鉴别

	挫裂创	锐器创
形状	不规则，常呈星芒状、波浪状	常呈线状、纺锤状，与皮纹有关
创缘	锯齿状，常伴擦伤、挫伤，出血较少	光滑、不一定伴有擦伤、挫伤
创壁	凹凸不平	平滑
创角	多圆钝，常有撕裂	多尖锐
创腔	较浅，有组织间桥	较深，无组织间桥

To Clinic Doctors

- **Easy Infection—promptly deal with**
- **Caution: debris**



To Forensic Medical Experts

- **Determine the Type of Force Instrument**
- **Debris in Wound—Conform Force Instrument**
- **Special Location—Nature of Case**
- **Fatal Injury**



骨折 Fracture

脱位 Dislocation



Fracture

syw

Swelling

Abnormal Shape

Abnormal Active

Bone Fricative

Complicated Dislocation



To Clinic Doctors

- **Diagnosis**
- **Treat –Fix、 Surgery**



To Forensic Medical Experts

- **Evidence of Force (direct or indirect)**
- **Type of Force Instrument**
- **Mechanic of Force**



内脏破裂Rupture of Visceral

- **Strong Force**
- **Fatal Injury**



To Clinic Doctors

- **Fatal Injury**
- **Emergency**
- **Ignored (blunt, stab)**



To Forensic Medical Experts

- **Fatal Injury—Dead Body**
- **Disability—Survivor**



肢体离断Amputation

- **Shattered Cadaver**碎尸
- **Homicide or Artificial**他杀
- **Accident Case** (explosion, traffic, et al.)意外



功能障碍Dysfunction

- **Neurogenic Shock**神经源性休克 — trigger region
(触发区)
- **Concussive Injury**震荡伤



机械性损伤常见死因

P56

- 原发性外伤死因
- 外伤后继发性死因



原发性死因

- 生命重要器官的严重损伤
- 失血性休克及出血
- 休克(traumatic shock, neurogenic shock)
- 震荡



继发性死因

- 感染
- 栓塞
- 窒息
- *ARDS*
- *Crush syndrome*
- 损伤愈合瘢痕(动脉瘤、癫痫)



Examination and Record P48



★ 机械性损伤的临床检查

- 全面、细致检查
- 详细记录，特别是一过性功能障碍
- 准确描述（部位、形状、大小、数量等）
- 保留证据（手术切除物、异物、附着物等）
- 固定损伤（绘简图、摄影或录像，标记损伤特征）
- 提取物证（法医）



各 论



钝器伤

Blunt Instrument Injury

共性Generality:

多种损伤并存Types of injury coexist

表里不一Different display between external and internal



棍棒伤 Rod-Like Weapon Injury

竹打中空（铁轨样挫伤）

train-line or railway line bruise



挤压伤Crush Injury

挤压综合征Crush Syndrome



高坠伤P52

Injury Due to Fall from Height



Characteristics

- 外轻内重
- 多种损伤并存，广泛而严重
- 远离着地部位损伤可更严重
- 多发骨折力的方向一致
- 一次性暴力作用可以解释所有损伤

